

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2001-089364**  
(43)Date of publication of application : **03.04.2001**

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(51)Int.CI.

**A61K 31/095**  
**A61K 33/04**  
**A61K 33/06**  
**A61K 33/26**  
**A61K 33/30**  
**A61K 33/34**  
**A61K 47/16**

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(21)Application number : **10-142119**

(71)Applicant : **TAIYO KAGAKU CO LTD**

(22)Date of filing : **08.05.1998**

(72)Inventor :  
**UEDA TOMOKO**  
**TANAKA YUKIKO**

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## (54) MINERAL COMPOSITION

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain a mineral composition containing theanine, having an improved metallic taste.  
**SOLUTION:** This mineral composition comprises theanine. Theanine can be prepared by synthesis from glutamine and ethylamine with a glutaminase enzyme or from an extracted solution of tea leaves. The mineral composition is an iron composition, a magnesium composition, a copper compound, a zinc composition, a selenium composition or a calcium composition.

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## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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**CLAIMS**

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[Claim(s)]

- [Claim 1] The mineral constituent characterized by containing a theanine.
- [Claim 2] The mineral constituent according to claim 1 whose mineral constituent is an iron constituent.
- [Claim 3] The mineral constituent according to claim 1 whose mineral constituent is a magnesium constituent.
- [Claim 4] The mineral constituent according to claim 1 whose mineral constituent is a copper constituent.
- [Claim 5] The mineral constituent according to claim 1 whose mineral constituent is a zinc constituent.
- [Claim 6] The mineral constituent according to claim 1 whose mineral constituent is a selenium constituent.
- [Claim 7] The mineral constituent according to claim 1 whose mineral constituent is a calcium constituent.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[The technical field to which invention belongs] this invention relates to the mineral constituent with which the metal taste has been improved. It is related with the mineral constituent containing a theanine in more detail.

#### [0002]

[Description of the Prior Art] In recent years, a bias is in a nutrition, and Japanese eating habits became rich, but on the other hand, according to the national survey on nutrition, they have some which are less than the reference value which the Ministry of Health and Welfare decides about a mineral. Then, although the mineral is added to food, a drink and a supplement, the fortification agent, etc. recently, the addition is restricted for the characteristic taste which a metal has, or the value as goods is demoted.

[0003] Although addition and the specific perfume of a sweetening agent are added for the improvement of the metal taste and the metal taste is conventionally cased to it, with such a means, there is a problem that sufficient effect is not acquired, about the metal taste component which gives strong displeasure. Then, the method (JP,3-236316,A) using microencapsulation and an inclusion compound as the masking method of the metal taste which gives displeasure etc. is taken. However, neither of the methods can mask the metal taste completely, or it has the trouble of being able to use it only for complication of a process, and the limited food. In the case of a drink, it is still more serious, and since a coating agent etc. cannot be used, although it adds high-concentration sugar and a high-concentration organic acid or the flavor is added, all of masking of the metal taste are imperfect. As the other methods, although the bitterness reduction method (JP,8-332053,A) of the magnesium salt by add , mix and emulsify the solution of magnesium salt into the mixture of polyglyceryl fatty acid ester and fats and oils , and make it the water type emulsification object in an oil be mention , if important heat sterilization be perform when addition to \*\*\*\* cannot be perform and the safety of food be secure , the application range will be restrict in that an effect fall sharply . moreover, the theanine is specified to be a food additive and is known as a flavor improvement constituent -- \*\*\*\* (JP,9-313129,A) -- it is not known about the improvement of the metal taste by containing a theanine until now

#### [0004]

[Problem(s) to be Solved by the Invention] this invention offers the mineral constituent which solved the above-mentioned problem.

#### [0005]

[Means for Solving the Problem] This invention persons solved the above-mentioned technical problem by making a mineral contain a kind of the amino acid that in green tea contained, and a theanine, as a result of examining the matter which has an effect in a metal taste improvement, and completed this invention. [ many ] This is the new effect which this invention persons found out for the first time. The effect of suppressing degradation of the flavor produced in case various minerals are added for a product has this invention article. It is effective for the astringent taste produced in more detail when a mineral is added for a product, bitterness, acidity, a salty taste, harsh taste, astringency, a pungent condiment, etc. Hereafter, this invention is explained in full detail.

#### [0006]

[Embodiments of the Invention] The theanine used for this invention is the glutamic-acid derivative contained in the tea leaf, and is the principal component of a brown taste. Moreover, it is used as a food additive which makes taste a use. Also in safety, there is no example of death in the acute toxicity test using the mouse at internal use (2g/kg b.w.), abnormalities are not accepted in a general state, weight, etc., but since it is the very safe matter, there is no limit in the addition.

[0007] As a manufacturing method of the theanine used for this invention How (Chem.Pharm.Bull., 19(7)1301-1307 (1971)) to carry out an organic synthesis reaction and to obtain a theanine, How (JP,7-55154,B) to make a glutaminase act on a glutamine and the mixture of an ethylamine, and to obtain a theanine, How (JP,5-123166,A) to aim at multiplication promotion of a cultured cell group, cultivating a brown cultured cell group by the culture medium containing an ethylamine, and making the theanine accumulated dose in a cultured cell group increase, Or the ethylamine in JP,7-55154,B and JP,5-123166,A may be transposed to ethylamine derivatives, such as an ethylamine hydrochloride, a theanine can also be obtained, and which method may be used. moreover, the theanine obtained by such method -- L-object, D-object, and DL-object -- although all are usable, since L-object has the high improvement effect of the metal taste, it is desirable especially

[0008] The minerals used for this invention are metals indispensable for maintenance of living bodies, such as iron, magnesium, copper, zinc, a selenium, and calcium, and regulation. the form A salt, an oxide, protein complex or the complex of the

decomposition product, polysaccharide complex or the complex of the decomposition product, other processing starch complex, cyclodextrin complex, Or it is an enzyme, a coenzyme, etc. which contain a metal in addition to metal activating enzymes, such as a metalloenzyme which has minerals, such as a superoxide dismutase, glutathione per oxidase, and an acid phosphatase, and a phospho GURUKO mutase, and an active center. Although these minerals may exist naturally, preferably, they carry out separation refining by the well-known method, and raise mineral content. Moreover, an example of the form of a mineral is given here.

[0009] As iron, iron, a ferrous-sulfate (dryness) ferrous sulfate (crystal), citric-acid iron, the first iron of a gluconic acid, the first iron of a pyrophosphoric acid, a ferric pyrophosphate, the first \*\*\*\* of a pyrophosphoric acid, ferric pyrophosphate liquid, ferric chloride, an iron lactate, a ferric ammonium citrate, an iron sesquioxide, a ferritin, a transferrin, an ovotransferrin, hem iron, etc. are mentioned. As magnesium, a magnesium carbonate, magnesium sulfate, a magnesium chloride, a magnesium oxide, L-glutamic-acid magnesium, etc. are mentioned.

[0010] A copper sulfate, a cupric gluconate, etc. are mentioned as copper. As zinc, a zinc sulfate, gluconic-acid zinc, two zinc oxides, etc. are mentioned. A selenocysteine, a selene methionine, etc. are mentioned as a selenium. As calcium, a calcium chloride, a calcium carbonate, a calcium hydroxide, A calcium lactate, a calcium gluconate, citric-acid calcium, L-glutamic-acid calcium, A calcium pantothenate, glycero calcium phosphate, 5'-ribonucleotide calcium, A calcium sulfate, a phosphoric-acid tricalcium, phosphoric-acid 1 hydrogen calcium, calcium propionate, A calcium primary phosphate, pyrophosphoric-acid 2 hydrogen calcium, carboxymethyl-cellulose calcium, A stearoyl calcium lactate, ethylenediaminetetraacetic acid calcium disodium, Sea urchin husks baking calcium, shell baking calcium, bone baking calcium, coral baking calcium, Milk-serum baking calcium, egg shell baking calcium, shell non-calcinated calcium, \*\*\*\* baking calcium, coral non-calcinated calcium, mother-of-pearl non-calcinated calcium, egg shell non-calcinated calcium, etc. are mentioned.

[0011] Although the mineral constituent of this invention article may be used as it is, it may carry out addition use at liquefied food, such as a dried food, a supplement, a soft drink, mineral water and a taste drink, and an alcoholic beverage, etc. Moreover, by medical supplies, it can add and tablet-ize to a tablet, powdered material, a granule, and a health drink. Moreover, it can be used combining with the essential oil which is other components, amino acid, a vitamin, etc., and especially the combined use with a vitamin is effective for the metal taste improvement of fruits or the workpiece of those. In here, although especially the essential oil to be used is not limited, peppermint oil, chamomile oil, lavender oil, camomile oil, eucalyptus oil, geranium oil, bergamot oil, etc. are raised. Although not limited especially in the amino acid to be used, a glutamine, glutamic acid, inosinic acid, etc. are raised, for example.

[0012] Although especially the process of the mineral constituent of this invention is not limited, the process which melts a mineral and a theanine and is made into a mixed solution into solvents, such as a process which carries out powder mixing of a mineral and the theanine, and water, and the process which freeze-dries the mixed solution, the process which carries out spray drying are mentioned.

[0013] Although it changes with strength of the metal taste which should improve, in order for the mineral constituent of this invention to fully demonstrate the effect, it is made a weight ratio, and the addition of the theanine in this invention is a theanine to the metal content 1 in a mineral constituent 10-3-106 The addition to contain is desirable. It is 10-1-105 still more desirably. The addition to contain is desirable. Moreover, the addition set to 10-1-104 is the most desirable.

[0014] Although especially the method of detection of a theanine is not limited, after derivatizing by the precolumn by the ortho phthalaldehyde (OPA), the method of carrying out a detection fixed quantity with a fluorescence detector in a high speed chromatography using an ODS column is mentioned.

[0015] As a product form of this invention, it is a solution, a suspended solid, powder, a solid-state moldings, etc., boiled fish paste, an soybean workpiece, a seasoning, a mousse, jelly, frozen desert, a candy, chocolate, a cracker, a cake, a pan, soup, coffee, cocoa, tea, juice, alcohol, medical supplies, etc. are various, and this invention is not limited by this.

[0016] Next, although an example explains this invention further, the ranges of this invention are not these things limited to seeing.

[0017]

[Example] Example 10.3M glutamine and 30 degrees C of 1.5M ethylamines were made to react in 0.3U/and a glutaminase among the boric-acid buffer solution (Na<sub>2</sub>B4O<sub>7</sub>-NaOH, pH11) for 22 hours. The theanine of 225mmol(s) was obtained from reaction mixture 1-. In addition, the glutamic acid of a by-product was 20mmol(s). In addition, refining from reaction mixture is Dowex about reaction mixture. 50x8, Dowex It applied to 1x2 column chromatographies, and this was performed by carrying out ethanol processing. The check of a theanine was performed by showing the same behavior as the standard substance, when this isolation matter was covered over the amino acid analyzer and the paper chromatography. When hydrolysis processing was performed by the hydrochloric acid or the glutaminase, glutamic acid and the ethylamine were produced at a rate of 1:1. Thus, since the isolation matter was understood by the glutaminase an added water part, it is shown that the ethylamine had combined with gamma grade of glutamic acid. Moreover, it was also checked by the glutamate dehydrogenase (GluDH) that the glutamic acid produced in hydrolysis is an L type, and it checked that the obtained compound was L-theanine.

[0018] They are through and 1N at hot water about an example 2 tea (*Camellia sinensis* L.) leaf after extraction and to a cation exchange resin ( Dowex HCRmade from Muromachi Chemical industry W-2). It was eluted by NaOH. The elution fraction according an elution fraction to through and 15%EtOH was condensed using RO film ( NTR[ by NITTO DENKO CORP. ] 729 HF) to activated carbon ( regent activated carbon made from Niumura Chemical industry SG), the column chromatography refined, recrystallization was performed further, and the theanine was manufactured.

[0019] Powder mixing of the theanine obtained in the example 1 was carried out to example 3 iron lactate with the mixing ratio

of 4:1, and the granular this invention article was obtained.

[0020] Powder mixing of example 4 zinc sulfate and the theanine obtained in the example 2 was carried out with the compounding ratio of 1:40, spray drying of the mixed-water solution which added the water 17 section to this constituent 3 section was carried out, and the granular this invention article was obtained.

[0021] Powder mixing of example 5 magnesium sulfate and the theanine obtained in the example 1 was carried out with the compounding ratio of 1:1000, spray drying of the mixed-water solution which added the water 15 section to this constituent 5 section was carried out, and the granular this invention article was obtained.

[0022] The organic-functions test was performed to the panelist of a total of ten man and woman using mineral constituent solution and 0.08% iron-lactate solution using this invention article obtained in the example of examination 1 example 3 0.1%. Evaluation of the metal taste performed 5 stage evaluations as 5 [ strong ], 4 [ a little strong ], 3 to sense, 2 sensed a little, and 1 which is not felt at all. A result is shown in Table 1.

[0023]

[Table 1]

	0. 1 %ミネラル組成物 水溶液	0. 08 %乳酸鉄 水溶液
金属味評価	1. 2	3. 9

[0024] In the mineral constituent addition division, the good result was obtained like [ as a result of Table 1 ].

[0025] The organic-functions test was performed to the panelist of a total of ten man and woman using 0.04% mineral constituent addition yogurt and 0.001% zinc-sulfate addition yogurt using this invention article obtained in the example of examination 2 example 4. Evaluation of the metal taste performed 5 stage evaluations as 5 [ strong ], 4 [ a little strong ], 3 to sense, 2 sensed a little, and 1 which is not felt at all. A result is shown in Table 2.

[0026]

[Table 2]

	0. 04 %ミネラル組成物 添加ヨーグルト	0. 001 %硫酸Zn 添加ヨーグルト
金属味評価	1. 3	4. 5

[0027] In the mineral constituent addition division, the good result was obtained like [ as a result of Table 2 ].

[0028] The organic-functions test was performed to the panelist of a total of ten man and woman using 0.2% mineral constituent addition cow's milk and 0.0002% magnesium sulfate addition cow's milk using this invention article obtained in the example of examination 3 example 5. Evaluation of the metal taste performed 5 stage evaluations as 5 [ strong ], 4 [ a little strong ], 3 to sense, 2 sensed a little, and 1 which is not felt at all. A result is shown in Table 1.

[0029]

[Table 3]

	0. 2 % ミネラル組成物 添加牛乳	0. 001 % 硫酸Mg 添加牛乳
金属味評価	1. 2	4. 7

[0030] In the mineral constituent addition division, the good result was obtained like [ as a result of Table 3 ]. It will be as follows if the embodiment of this invention is raised.

- (1) The mineral constituent characterized by containing a theanine.
- (2) The iron constituent characterized by containing a theanine.
- (3) The magnesium constituent characterized by containing a theanine.
- (4) The copper constituent characterized by containing a theanine.
- (5) The zinc constituent characterized by containing a theanine.
- (6) The selenium constituent characterized by containing a theanine.
- (7) The calcium constituent characterized by containing a theanine.
- (8) aforementioned (1) - (7) characterized by manufacturing a theanine by making a glutaminase act on a glutamine and the mixture of an ethylamine -- either -- the constituent of a publication
- (9) The constituent given [ aforementioned ] in (1) - (7) characterized by a theanine being the tea origin.
- (10) aforementioned (1) - (7) characterized by making it a weight ratio and adding a theanine 10-1-105 times to a mineral 1 -- either -- the constituent of a publication
- (11) aforementioned (1) - (10) whose theanine is an L-theanine -- either -- the constituent of a publication

[0031]

[Effect of the Invention] As explained above, a great effect having this invention article in a metal taste improvement, and using this invention article also considers and combines an effect and the point of safety, and it is very useful.

[Translation done.]